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ABSTRACT

The guidelines provided incorporate principles and themes emerging from the re-evaluation of unsuccessful large-scale educational intervention programs in developing countries. Recommendations for effective programs include (1) a decentralized mode of operation, (2) local participation in designing and carrying out programs, (3) a multi-focus on community life, and (4) a strong emphasis upon problem prevention. The Model Educational Communication System (MECS) for improving rural education in Indonesia is described in a case study of the application of effective development themes and principles. The radio, audiocassette, and communication satellite component services of MECS are described. (CHV)

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COMMUNICATION SYSTEMS AND THE NEW RURAL DEVELOPMENT STRATEGIES WITH A CASE STUDY IN INDONESIA

#11

Royal D. Colle

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FOREWORD

"Participation" is becoming a key word in designing and developing rural development programs. Aid programs, whether they originate with the urban oriented government leadership of a nation, or with a "foreign aid" or international aid organization, seem more interested these days in the participation of rural people in decision-making, implementation, and evaluation as well as in the benefits of rural development efforts.

This paper results largely from a short term assignment for USAID the author was fortunate to have had in Indonesia. It started from the concern of using modern communication technology to upgrade rural education and emerged into a somewhat broader problem of creating or modifying institutions for promoting greater local participation in development efforts. The focus remains, however, on communication and education for these are vital elements in establishing the capacity for participation. The introduction to the Report submitted to USAID provides a glimpse of the perspective from which this paper begins.

> The temptation is great in many parts of the world to launch extraordinary, sophisticated, technologically-based projects to meet the tremendous needs in education, food production, population, health and social welfare, and other aspects of social and economic welfare. However, the history of development efforts has seen too many cases of such "big" projects whose impact barely survived the initial flash of publicity.
>
> We have resisted the temptation to be "spectacular." In designing the Model Educational Communication System (MECS) we have tried to create a program -- not simply hardware -- which would have early impact. But equally important the MECS would have implications for a long-run rural development effort emphasizing communication at the village level. We have tried to build on past accomplishments, and weave new technology and innovative techniques into a system that can be adapted to the diverse conditions that characterize Indonesian rural life.

This perspective was molded in part by many revealing experiences and contacts in Indonesia: by traveling via riverboat and on foot to visit remote communities in West Kalimantan; by hiking across paddy fields to talk with village leaders and school teachers; through discussions with officials at various levels of government. Although this paper deals very substantially with Indonesia, the issues it presents are issues that exist in many nations, developed and developing, as long as "participation" has a role in rural development programs.

The text includes a substantial amount of the material found in the USAID Report and thus it is not only appropriate, but a pleasure, to acknowledge the contribution made by Dr. Stanley Handleman, Dr. David Sprague, Dr. Alvin Miller and especially by our Indonesian friends and others who helped inspire the paper. In a very real way, it is their paper as well as mine.

R.D.C.
November, 1976

"...but the crucial test is whether the program of information makes sense when it reaches the rural family."

Introduction,
Integrated Communication

COMMUNICATION SYSTEMS AND THE NEW RURAL DEVELOPMENT STRATEGIES

Despite the commitment of vast human and monetary resources to rural development during the last two decades, poverty, malnutrition and poor health engulf more people than ever before. Some of this can be attributed to population growth--there simply are more people--but unhappily much can also be attributed to poorly designed and poorly executed intervention programs, including the failure to convert successful trial projects into regular programs.* In the 1970s we are seeing serious re-evaluations of these earlier strategies and challenging the top-down, centralized systems characteristic of those earlier days.

This paper is an attempt to formulate a plan for putting into practice some of the principles and concepts emerging from these re-evaluations. It goes a step further in suggesting measures which can be taken to attack the dilemma of too few village level change agents to meet the demands implicit in the new rural development strategies. This includes the use of new communication technology in a context in which villagers themselves have more control over the communication process than has generally been the case.

Assumptions about the social change situation

Following are several assumptions which will help clarify the foundation on which the major part of this paper rests.

1. A substantial proportion of people in developing nations--probably around 40%--lack services and opportunities generally considered necessary or desirable by the other 60% for a reasonable existence.

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*Alan Berg (The Nutrition Factor, Its Role in National Development, The Brookings Institute, Washington, 1973) states that in the last ten years the applied nutrition program in India, the largest of the nation's nutrition education undertakings, has reached fewer people than the population growth during the same period. (p. 79). For Berg's somewhat pessimistic discussion of the progress made through nutrition extension, see chapter 6, pp. 74-88.

2. Social change resulting in modification of individual behavior and/or community institutions is a desirable process for improving the welfare of those people.

3. A margin of change is possible within existing socio-political structures which will enable those "left behind" people to cope better with daily living without having to wait for major shifts in political power (for example: revolution, massive land reform, etc.)

4. Small gains can be important gains, both for their intrinsic benefits and for their "wedging" role (i.e. in helping set the stage for further social change). Thus it might be possible and appropriate to improve health conditions even though economic opportunities temporarily remain stable.

5. Information, education, and communication constitute important ingredients in rural development programs. They may lead to ways of reaching, creating, or attracting services; to ways of making better use of services; or to means for self-help.

The manpower dilemma.

During the last three decades the principal source of services to rural people has been the extension worker--a professional trained in a specialized area--who usually worked among rural communities to promote better practices in his/her area of expertise. It might have been agriculture, animal husbandry, food preparation, etc. These extension people often worked on an interpersonal basis, i.e. one-to-one or small groups, sometimes buttressed by demonstration plots or mass media. "Community development" strategies stressed provision of multiple services, preferably in an integrated, comprehensive way.

Paraprofessionals. A distinguishing mark of social intervention programs in more recent years has been the introduction of paraprofessionals--persons with relatively short-term specialized training to carry out some of the more routine parts of the professional's responsibilities.

These have included agricultural monitors, nutrition aides, dental promoters, medical auxiliaries, barefoot doctors, teaching aides, etc. A variation in community development programs has been the multi-purpose village level worker.*

Use of paraprofessionals has been stimulated partly by the shortage of regular professional manpower but also by the realization by development agencies that a cultural gulf exists between the "establishment types" and the newly significant, low income "client groups." One way of closing that gap was to recruit persons from the client group, give them some short term training (and sometimes in-service training) and have them serve as conduits for services and information to their constituents.

Shortages. The results of these intervention programs are mixed. There have not been enough durable successes in using them to give great confidence in significantly reducing poverty conditions in the world. Indeed, as indicated earlier, the number of people not served by rural development programs seems to be growing and poverty conditions are worsening.** There seems to be neither manpower, money nor enough time to train the people needed to meet, in the conventional ways, the enormous demands which arise when official policy tries to make millions of people more active and equal participants in a nation's life patterns. Speaking to his Board of Governors in 1973, World Bank President Robert McNamara said:

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*For a discussion of the village level worker's role, see Syed A. Rahim, Communication and Rural Development in Bangladesh. East-West Communication Institute, Honolulu, 1976, pp. 17-19.

**In Guatemala, for example, the percentage of persons 0-5 years old suffering from malnutrition has grown in the past 10 years from 74% to 81%. For a similiar comment about the inadequacy of rural development efforts in Asia see ERD (mentioned below), p. 1.

"Obviously it is not possible for governments to deal directly with over 100 million small farm families. What is required is the organization of local farm groups, which will service millions of farmers at low cost, and the creation of intermediate institutions, through which governments and commercial institutions can provide the necessary technical assistance and financial resources for them....

The projected number of trained personnel who will graduate annually from existing agricultural educational institutions can at best satisfy less than half the total needs of the developing world." (Emphasis added.)

McNamara went on to point out that the ratio of agricultural agents to farm families in the developing nations is about 1:8000. There is an equally severe shortage of such people in the health, dental and nutrition fields. In one department (a geographic unit similar to a district or county) in Guatemala the ratio of dentists to rural people is 1:168,700!

More than numbers. It is conventional knowledge that numbers alone do not reveal the full extent of the dilemma. Speaking about agriculture, McNamara pointed out to his Board that "only a small fraction of these limited services is available to the small farmer." Services tend to go to those communities which are near the good roads, and to those people who are already better off than the 40% "left behind." The author recently traveled into the shallow interior of Indonesia's West Kalimantan (formerly Borneo) via river boat and on foot and found that four out of four villages visited had not had any non-formal education programs.

While there may be no systematic evidence, observation of intervention programs suggests at least two other conditions that make the situation worse than indicated by numbers alone. One educated hunch is that an abundance of time that could be fruitfully used in field work is consumed by bureaucratic paper shuffling--a situation which rural development workers often willingly tolerate rather than go into the field.

Another educated hunch would be that effective use of rural development people to date has been limited by their "alien" status in the communities where they work--a situation aggravated by the limited amount of time they spend in a community.* It seems plausible to suggest that resistence and short-lived programs also result from the threat these people represented to the communities' traditional power structure.**

Overcoming the manpower dilemma--including some of the associated difficulties of effective use of manpower resources--will provide change agencies their biggest challenge in the years ahead. The solution is likely to be shaped in part by some of the themes running through recent rural development literature.

Sources of current themes in rural development

Three recent publications reflect the thinking and expertise of a wide range of persons associated with rural development, including government, university, foundation and agency people from different parts of the world. They include researchers, planners, administrators, and operational people. The publications are:

1. Extended Rural Development, (hereafter referred to as ERD) published by the Rural Development Committee at Cornell University. This monograph was the result of a conference at Cornell University on training and research needs for rural development in Asia. The conference, in turn, was based on a series of trips throughout Asia in which various Cornell faculty members talked with leaders in government and education about these needs. These activities took place in 1974.

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*In India's Intensive Agricultural Development Program, an extension worker was responsible for 1000 farmers spread out in different villages. Despite the title of the program,it was obviously very difficult for an agent to deal very intensively with a farmer, a group of farmers, or the communities in which the extension person worked. In many cases, he certainly must have been considered an "outsider."

**Rahim (p.49) notes that in the Comilla Rural Development Project: "In some cases, the traditional leadership positions in the village were threatened by the increasing power of the cooperative's manager or model farmer."

2. Integrated Communication, (abbreviated IC in future references), published by the East-West Communication Institute. The subtitle of this publication summarizes its focus: A Report on the International Conference on Integrated Communication for Rural Development. The conference was held at the East-West Communication Institute in 1974 and included people with considerable rural development experience in Asia.

3. Effective Communication with the Rural Poor, (Executive Summary), published by the Academy for Educational Development. This is an overview of two longer volumes which report on a study sponsored by USAID's Office of Education and Human Resources, Bureau for Technical Assistance. The study includes interviews with 123 people from international agencies and university communities; a review of theoretical and research contributions of several behavioral sciences and "hundreds" of reports of development projects; and personal visits to projects in less developed countries. Heli E. Ennis de Sagasti prepared the report during 1974-75.

Rural development themes.

Among the themes which emerge from these varied expert resources are the following:

1. Rural development should be characterized by a decentralized mode of operation.

For example, the thrust of the "extended rural development" concept is that a rural development program cover a wide geographic area, yet be varied enough to meet local circumstances. Both of these conditions imply a great need for manpower and material resources, which, according to ERD thinking, must be mobilized in the rural sector itself. (ERD, p.4)

Likewise, Sagasti recommends that rural development projects consider

> ...the need for flexible planning of rural development programs which a) allow more general objectives of national or regional plans to be made specific at the local level in response to existing sociocultural and situational differences; and b) allow such objectives to be modified or revised in response to feedback from the field. (Sagasti, p. 15)

2. There should be greater local participation in designing and carrying out programs.

The ERD group indicates, for example, that expanded rural development strategy depends on a system of organization down to the local level and that the system must be "local organization intensive." (ERD, p. 8) Further: "We envision local people increasingly identifying and organizing training sessions with or without outside assistance." (ERD, p. 12) Local elements in the rural development system should be considered the first rung of the development system rather than last link.

Sagasti also indicates

> ...the need for participation of the local people in decision-making about specific development actions to be taken by them, in order to ensure appropriateness and responsiveness of development plans to rural people's needs and possibilities.* (Sagasti, p. 15)

3. Rural development programs should be multi-focused.

The new labels being appended to rural development (i.e., "integrated rural development" and "extended rural development") reflect this emphasis on dealing with several aspects of community life rather than one. Ensminger makes the point quite directly: "Institutions...are rural and family oriented, and not agriculturally oriented." (IC, p. 7) In outlining policy recommendations for external assistance agencies Sagasti suggests as a key area for focus, the training of multi-purpose village level workers selected from rural populations. (Sagasti, pp. 25-26)

4. There should be a stronger emphasis on prevention than was characteristic of traditional rural development programs.

Whereas the veterinarian might formerly have devoted most of his attention to treating diseased animals, the strategy in an extended rural development program would have him dealing more broadly with the causes of the problems and promoting measures to prevent them from occuring in the first place. (See ERD, pp. 33-34) Prevention-oriented

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*Interestingly, this is also a position being taken by some professional communication people in the production of their content. See "Film in Development," ICIT Report, No. 14 (April 1975). Information Center for Instructional Technology, Academy for Educational Development, Washington.

programs require fewer highly skilled technical persons (such as doctors), and more resources for "routine" services and for providing information and education. It is a shift from a relatively intensive program for a few, to an extensive program serving many. Berg's comment (1973, p. 18) that "...clearly it is easier to prevent malnutrition than to cure it" reflects the growing concern over scarce sophisticated resources for dealing with problems of the poor.

Operationalizing the "new rural development"

Threaded throughout the problems, strategies and themes discussed above is an implicit and significant role for communication. Encouraging local people to participate more in determining and controlling their destinies suggests a better informed and educated populace. Better dental care may require ingenuity in adapting local materials for "tooth brushes" and some preventive clinic services, but it also requires a program to persuade parents of the need to reinforce such practices in the home. In fact, it seems unlikely that the new rural development strategies can be effectively implemented widely without a conscious, deliberate communication strategy woven into the fabric of the rural development program. Furthermore, in much of the developing world, this communication strategy must help overcome the manpower dilemma by developing communication systems for education and information which are based on simple communication technology. The stress must be on simple technology partly because of cost factors, partly because of its operational simplicity, partly because of power and logistical considerations, and partly because of the need to use information materials which can be patterned to local communities' needs. Inevitably, simple technology must take over much of that part of the change agent role that was devoted to providing information and non-formal education directly to the ultimate consumer at the village level.*

*see the middle of the following page for footnote.

Does this leave no place for the more sophisticated technology such as television and communication satellites? Despite dramatic experiments in such places as India, Alaska and the Rocky Mountain region of the United States, such technology in the near future can play only a very limited role in the new rural development strategies within the next decade.** The challenge to developing nations now is to make realistic use of the more sophisticated technology--which has a strong centralizing, homogenizing bias associated with it--to support of a development strategy more mosaic in pattern.

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*Berg (p. 79) notes: "The personal transfer of information obviously has merit. But even assuming that person-to-person nutrition education translated to a large scale effort can sustain accuracy in its instruction and enthusiasm in its workers, it cannot overcome the basic limitation of person-to-person communication: the size of the audience. The number of persons in the lower socioeconomic groups that can be reached varies by country but is seldom great, especially in larger countries. The needy ordinarily do not participate in--and often are not aware of--activities from which they might benefit. To reach them would require an army of field workers--in some cases diverted from other priorities--and an army-like budget, requirements unlikely to be met by the already strained resources of most developing countries. Rahim (p. 55) indicates that "The interpersonal network of communication in Comilla was adequate to carry information into the villages and transmit feedback only so long as the scope and coverage of the project were limited. But with the expansion of the project the interpersonal system was overloaded...The Academy failed to develop a mass media support system that could reduce the load on the interpersonal channels and minimize the distortion and loss of information that was transmitted by the managers and model farmers. This proved to be a serious weakness of the communication system in Comilla."

**This point is elaborated further in the author's paper: The Frontiers of Communication, paper prepared for the Cornell-CIAT International Symposium on Communication Strategies for Rural Development, Cali, Colombia, 1974. See also Wilbur Schramm, Big Media--Little Media, Agency for International Development, Washington, 1973, David R. Evans, Technology in Non Formal Education, A Critical Appraisal, Center for International Education, University of Massachusetts, Amherst, 1976 (lithographed); and Henry T. Ingle, Communication Media and Technology: A Look at Their Role in Non Formal Education Programs, Academy for Educational Development, Washington, 1974.

Communication, technology and rural development in Indonesia.

The author had an opportunity to deal in a very concrete way with many of the issues raised in this paper while a member of a team exploring the application of satellite technology to rural development problems in Indonesia.* In anticipation of its new communication satellite, there was considerable interest in Government of Indonesia circles in exploring use of the satellite in education. But what started out focusing on satellite communication ended up being a system consisting of a broader range of communication technology, largely in consideration of some of the issues outlined thus far in this paper. The result is MECS, a Model Educational Communication System for improving rural education in Indonesia.

Highlights of the MECS

It is important to highlight some of the main features of the Model Educational Communication System before being swallowed up in the details.

Although it is a village level non-formal education rural development scheme, its most striking feature is the absence of any new organizational structure at that level. The system relies on the existing social organization for its implementation. Obviously this runs the risk of encountering village stratification structures which may impede the flow of benefits to the poor. It has happened before. Kumar notes, for example, that community development programs failed in India because certain strata controlled or dominated village formal and informal institutions and this sometimes stood in the way of mobilizing the rural population. (IC, p. 102)

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*Other members of the team included Dr. Alvin Miller, Dr. Dean Jamison, Dr. David Sprague and Dr. Stanley Handleman. While the author prepared much of the report on which the following discussion is based, he benefitted greatly from material gathered by the whole team, by discussions and suggestions of the team, as well as contacts with a great number of Indonesian government officials, teachers, and villagers, and with specialists in the Bureau of Technical Assistance of USAID and the Academy for Educational Development.

On the other hand it is important to have durable institutions participating in rural development programs, not some that will flourish only briefly and then wither away. Building on local institutions also avoids the problem of "outsiders" threatening village leadership or of outsiders having to learn the structure and "cultivate" village communities where they will work.*

The MECS also acknowledges the point that there is not likely to be any significant breakthrough soon in moving specially and adequately trained rural development workers into the thousands of villages beyond the reach of regular roads and river lanes--the kinds of villages that make up much of the developing world.

Thus, another characteristic of MECS is that it puts much of the choice and initiative squarely on the shoulders of villagers themselves for bringing development information and non formal education into the village.

This does not mean that villagers must be the experts. But they can identify the important problems of the community and mobilize resources that will help them understand the problems and perhaps begin to deal with some of them. A key to this process is having a range of development-related information (e.g. on health, nutrition, literacy, agricultural and marketing techniques, etc.) readily available to community leaders which they can use at the most appropriate and convenient time.

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*The importance of the local structure is emphasized by Harsono Suwardi, professor at the University of Indonesia. He says that even though the mass media provide people with basic information, village people remain "quiet." Before they act as a result of new information, "they need actually to be encouraged first by a person in their immediate environment whom they know and respect. These persons might be opinion leaders, formal or informal leaders." From Radio to Satellite Broadcasting, Problems and Prospects Toward Indonesian Development Process paper prepared for the Program of Advanced Study on Communication Technology in a Changing Society: Explorations in Institutional Reactions - New Understanding in Communication, East-West Communication Institute, 1976, p. 11.

MECS provides a community oriented resources reservoir upon which village teachers, women's clubs or village leaders can draw and to which they can contribute. Placing such a responsibility on the community itself is a relatively new "self help" strategy consistent--perhaps to an extreme--with the notion of local participation.* It means that programs which evolve are more likely to be those of the village, undertaken at a time when the village is ready. "Real change," says Sagasti, "that is, appropriate and lasting change, can only take place when people are ready for it and committed to it." (Sagasti, p. 18)**

It is also important to stress that the program outlined below does not constitute a complete rural development system. It is basically the information/education component. It is not a delivery system, for example, for dental or nutrition services. But it is a communication system which can contribute substantially to a readiness and demand for these kinds of services. In many rural areas, services are available or can be secured but people do not know how, or are not motivated, to take advantage of them.*** And it is clear that information and education can eliminate or reduce the need for some services through promotion of effective "prevention" practices.

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*However the principle seems consistant with the "gotong-royong" philosophy in Indonesia of cooperative undertaking in which "one problem in a village will become a whole village problem. See Suwardo (1976), p. 12. Also Sven Hamrell, Executive Director of the Dag Hammarskjold Foundation comments in his introduction to the Uppsala Workshop report on Film-making in Developing Countries: "Experts are learning that village people have a 'fair idea' of their development problems, can express them well and be innovative in solving them" (ICIT Report No. 14)

**Compare with Ensminger's comment on what has heretofore been the situation: "...those who are now expressing support of rural development are doing so as a means of achieving their own program objectives." (IC, p. 10)

***Kamien points out that although many health services were available to Aborigines in a New South Wales community, many of the Aborigines did not make appropriate use of them. Kamien places much responsibility on the providers who rendered services at times and places convenient to themselves. But the role of communication is revealed in his observation that "it is apparent that neither the doctors and nurses on one hand nor the Aborigines on the other had much insight into each other's conceptual world." (cont. p. 13)

Despite the emphasis on "localism," national priorities are also important. In the MECS one of the important roles of the professionally trained change agent is to mobilize national materials and make them locally appropriate. The agent is not expected to be the physical, interpersonal communication link with the villages. This is a role for communication technology.

Background of MECS

Indonesia faces many of the same problems that plague many other developing nations: poverty, low literacy, inadequate rural education system with high drop-out rates in the elementary schools, health and nutrition deficiencies, etc. And coupled with these is a shortage of resources for dealing with the problems. As elsewhere, the most acute and persistent difficulties are in the rural areas, especially those hardest to reach with ameliorative programs. National policy, however, asserts that these areas can no longer be ignored and left behind.

Among the priorities identified by Indonesia's five year plan, Repelita II, is improving rural education, including formal education at the elementary level, and non-formal education (NFE) for the rural out-of-school population. NFE includes a wide-range of subject matter--agriculture, basic education*, health, vocational training, citizenship, etc.--and therefore implies involvement by different government departments (ministries).

***(cont.) Max Kamien, "Cultural Chasm and Chaos in the Health Care Services to Aborigines in Rural New South Wales," Medical Journal of Australia Special Supplement, 1975, 2:10. A similar situation existed in rural New York State, where despite the availability of social welfare services and an abundance of formal communication media, the rural poor often were unaware of low cost health care and other "programs" through which they could benefit. See Royal D. Colle, "CSCS: An Experimental System for Communicating with Hard-to-Reach People", Papers in Communication, No. 1, Department of Communication Arts, Cornell University, Ithaca, NY, 1973.

*Basic education itself contains a variety of ingredients, including numerical skills, language, sanitation, etc. See Education, Sector Working Paper, World Bank, Washington, 1974.

The Indonesian Government (GOI) has been exploring the application of educational technology to attack those needs. The problem in Indonesia is particularly difficult because of geographic obstacles: it is a nation of islands stretched across an expanse of some three thousand miles, with scarce transportation infrastructure in many areas. Within this territory lies a tremendous cultural and economic diversity. Indonesia's heterogeneity makes it inappropriate for massive, uniform, highly centralized intervention programs. The MECS was designed to meet these challenges.

The Model Educational Communication System integrates satellite communication, radio broadcasting, audio cassette technologies into an operation which can swiftly provide Indonesian villages in the farthest provinces the latest information and assistance from national and provincial centers. (See the diagram on the following page.) Another major component of the system, PENMAS, Indonesia's community oriented NFE agency, provides the possibility of localizing these materials for the smaller geographic and political units, as well as coordinating the dissemination of information for kabupaten and kecamatan offices of Government departments such as Health, Agriculture, etc.* The system also provides school teachers, village leaders, and others opportunities to develop and use local resources effectively to pattern learning and development projects to the cultural conditions of the community. This is discussed in more detail below.

While it is a system which can move educational material rapidly from senders to receivers, it is also a system which will enable a community's members to receive information and training at a pace and in a form most appropriate to their various needs and learning circumstances.

Approaches to the rural education problem.

Following are some of the approaches specifically related to educational technology for improving rural education which emerged from educational institutions, meetings with government officials, students and others in the cities and the rural areas.

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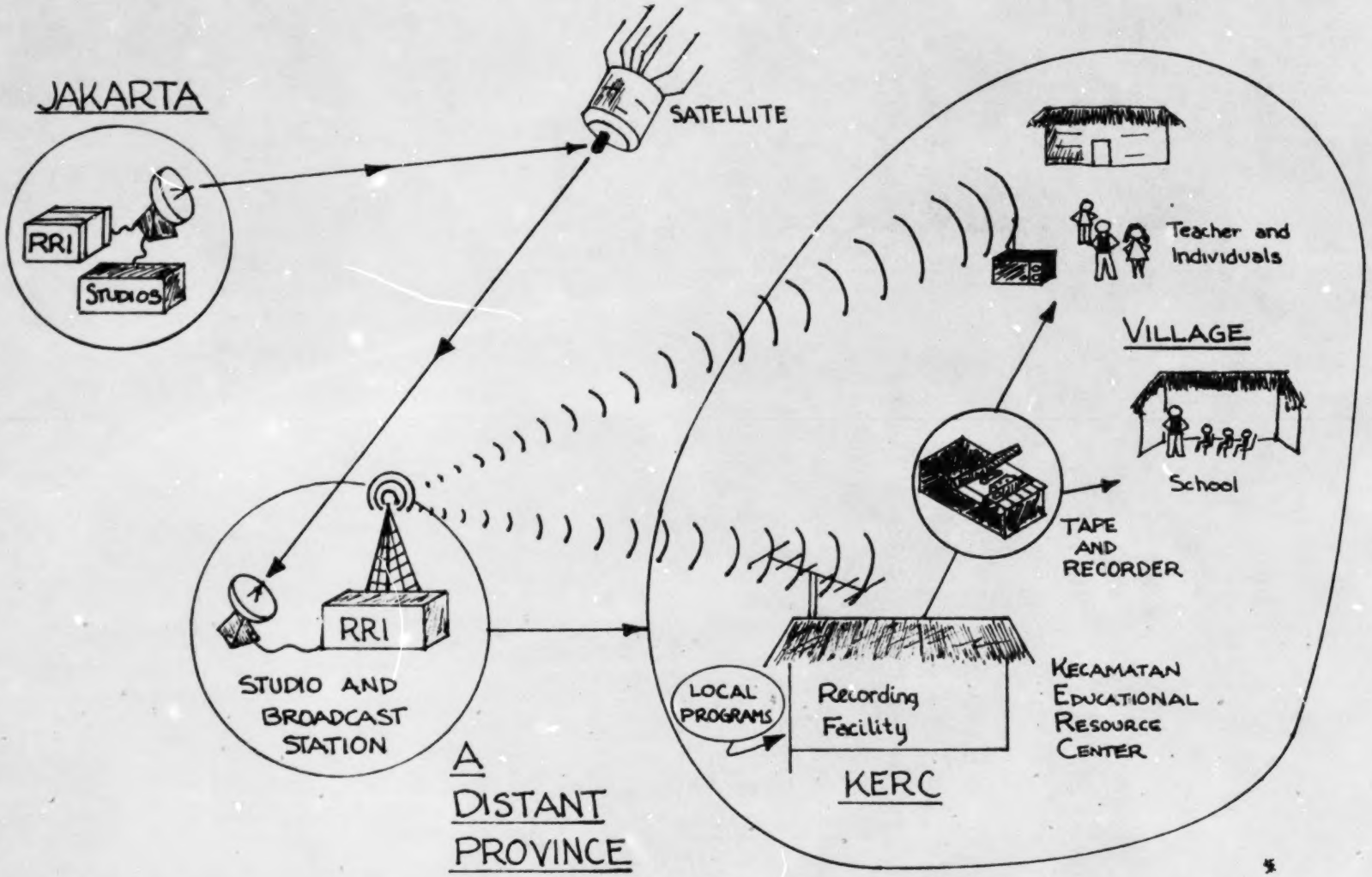
*The main geo-political units mentioned in this paper, from largest to smallest are: nation, province (state), kabupaten (district), kecamaten (sub-district) and village. "Village" and "community" are used interchangeably.

MODEL COMMUNICATION SYSTEM

FOR IMPROVING RURAL EDUCATION IN INDONESIA



One approach is to provide more extensive in-service training for village elementary school teachers. This includes providing training directly to the teacher during hours when the teacher is not in the classroom.

Another approach is to provide information and lessons directly to students via educational technology. While students learn from experts provided through technology, teachers can benefit in two ways: first, they (along with the students) can learn what may be new classroom material; and by studying methods used by those presenting the material, the teachers can learn new teaching techniques.

A third approach is to involve parents in the educational process. This assumes that the school-drop out problem, which wastes valuable resources in several ways, is as much and perhaps more a "parent" problem than a student problem. Parents who do not know and/or do not understand the school program may decide that working in fields or tapping rubber trees is a more valuable use of daytime hours than school. Thus communicating with parents of school children is a vital part of the over-all process of up-grading rural education.

A final aspect of rural education involves providing families with information to help them cope better with their environments--and perhaps improve their environments. For example, the health and nutritional status of school children influences their attendance at school and their ability to function effectively while in school. Furthermore, the overall character of the community may be influenced by the opportunities its citizens, including the young out-of-school youths, have to learn skills and to acquire attitudes through non-formal education.

Thus a rural education program can have many facets, some of which are not traditionally and conspicuously "education." In this project it was suggested that an educational technology system should try to deal with all of these approaches, in an integrated way, although administratively the responsibilities may lie in several different Departments or Directorates of the Government.

Cultural and economic considerations indicated quite strongly that the most appropriate medium for a system using educational technology should be based on aural communication. Many rural societies -- and this is the case in Indonesia -- have a stronger oral/listening tradition than print or visual, and research clearly indicates that people can learn from audio-only messages.*

Components of the Model Educational Communication System: An Overview

Using radio. Radio has been used around the world in various educational applications. Because radio can hurdle geographic barriers, it can be used to communicate regularly with teachers and community leaders to give them helpful information on education and development matters on a regular basis. Radio is especially helpful in conveying timely information uniformly to teachers widely dispersed in a province or kabupaten, and to provide some NFE directly to rural communities.

Using audio cassettes technology (ACT). Audio cassettes are being used in rural development throughout the world. In Indonesia, too, it is possible to find cassettes being used to communicate with rural people. Among the characteristics of ACT which makes it appropriate for the Model Educational Communication System include:

1. Timing. A cassette can be used when the user is ready and when other associated materials are available. For example, schools in Kecamatan Sei Ambawang (located in West Kalimantan and part of what was formerly called Borneo) seem to operate on different schedules. Trying to schedule a broadcast for in-school consumption that would be suitable to all of them would be impossible. Also, a cassette can be used to explain to teachers how to use new textbooks or other materials when they are actually available. Cassette use can also be scheduled around other community events which may be unknown to a radio station, or even if known, it would be difficult for the station to adjust schedule-wise for individual communities.

*See, for example, the content and bibliographies in the following: Schramm, (1973) Emile McAnany, Radio's Role in Development: Five Strategies of Use Academy for Educational Development, Washington, 1973; and Quality in Instructional Radio, Summary of a Seminar, Radio Software Research Project, Center for International Education, University of Massachusetts, Amherst, 1976.

2. Flexibility. A cassette message can be made as long or as short as the message demands. On radio, the message must usually fit the station's scheduling system.

3. Repetition. Users of cassettes can play back a recording as many times as they wish. This tends to be one of the great advantages mentioned by agencies which use cassettes in education/information programs. Radio cannot usually provide the same opportunity for a person to hear a second or third time material not clearly understood the first time. With ACT, the frequency of repetition is relatively unlimited.

4. Localized. Content can be patterned to the local community. Within one kecamatan in West Kalimantan there is what appeared to be a strongly religious community and one whose people migrated from Java; another seemed less religious and more "indigenous." It is relatively easy to meet what are likely to be differing needs of the teachers, students, and adults in these communities by tailoring cassettes to these local conditions.

5. Participation. Cassette technology offers the opportunity to use material produced by the consumers, i.e., by the villagers themselves. This may be both cultural and educational material which can be shared internally and with other villages.

6. Feedback. With machines that record as well as playback, villagers can articulate their views and needs without such "intermediaries" as written messages or live messengers.

7. Lack of pressure. The audio cassette technology component avoids the problem of having to constantly produce material to satisfy the voracious appetite of a radio series. Writers and producers can take time to develop good materials rather than to have to meet difficult deadlines simply in order to have something ready for broadcast.

8. Purposeful. This is similar to the item above (#7) but applies to the consumer end of the system. Listening to a regular radio broadcast may have an advantage in building a habit; however, it may also become routine and uninspiring. Building an activity around a deliberately selected cassette program makes the exposure a purposeful event.

9. Simplicity. Anyone can operate a cassette tape machine with 5 minutes instruction or less.

10. Durability. The tape cassette itself and the tape machine are relatively durable because most moving parts are concealed.

11. Transportability. The machines are small and light weight. This, of course, could present a problem in trying to prevent stealing. The norms concerning stealing of community property vary from place to place and distribution methods have to be adapted to local custom.* General experience with the use of audio cassette technology in rural areas suggests that there is usually more difficulty in keeping track of the equipment in the offices of the agency than in the rural communities. Damage and carelessness with equipment also seems to be higher in the agency than in the rural community.

12. Retention. Cassette content can be protected against erasure by removing a small "tab" on the back of the cassette--a very simple operation. The cassette can no longer be used for recording, but can continue to be played back.

13. Availability. Cassette technology is widely available in Indonesia. Most of the school children even in remote rural schools knew what cassettes were, and one can find cassettes on sale commercially from Pasar Baru to Kuta Beach, Bali. Indeed, they are being used by "catechists" in villages in Central Java, and probably elsewhere. Music cassettes are more available in Indonesia than are phonograph records.

The operational center of the audio cassette communication component would be at the kecamatan, administratively one level above the village. Here also are headquarters for various rural development professionals concerned with providing services to the villages. Also in the kecamatan are the PENMAS people, whom the GOI has charged (GOI Decree No. 32) with responsibility for coordinating all NFE programs. In the MECS, the PENMAS unit would be the most appropriate agency to operate the Kecamatan Educational Resource Center or KERC. From this center, villages could find and borrow materials to carry out village-designed NFE projects. More information on how the KERC operates in the overall system will be provided below.

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*Various distribution variations are discussed in the author's "Distribution Patterns for ACT in Rural Development," in Five Papers on Cassette Special Communication Systems, Department of Communication Arts, Cornell University, Ithaca,NY. 1975 (lithographed).

The communication satellite. The design of Indonesia's new communication satellite system includes at least one ground station in each province. With the satellite and ground stations, educational material and development information in audio format eventually can be diffused throughout the whole nation simultaneously. This can include content developed by experts in education, agriculture, health, nutrition or any agency offering NFE for rural people. The "final" link to the rural population can be either through radio braodcasting or through the KERCs.

The diagram on the following page summarizes the components and their uses in the MECS.

The Model Educational Communication System in Action

Each of the key components of the MECS has a specific role to play. For example, radio is most suitable for conveying: (a) information that is uniformily applicable over a wide geographic area; (b) information that is relatively easy to assimilate when heard only one time; (c) information that does not have to be coordinated with other materials, or with time schedules of schools; and (d) information that can be understood by a teacher (and village) population characterized by a wide range of intellectual capabilities.

The KERC component, based initially on audio cassette technology, is most suitable for providing teachers and other listeners with: (a) material which may require more careful and concentrated listening; (b) material which involves written exercises, or note-taking; (c) material which includes "drill" or repetitious exercises, (d) material which may require pacing according to an individual listener's ability; (e) material that is coordinated with books or other materials; (f) and material that is patterned to local conditions.

The satellite's role is that of rapid delivery of timely materials from national centers to provincial redistribution points.

Following is a more detailed description of how the system would work.

Components in Model Educational Communication System

	Services	Comments
SATELLITE	Relay of audio programs and messages	Swift diffusion to remote provinces Intermittent, "on-demand" use Fore-runner to model for television in education.
RADIO	Broadcast programs to teachers out of school	Weekly broadcast content: ·educational techniques and philosophy ·enrichment programs ·news of educational developments ·promotion of use of KERC materials
	During non-broadcast hours, relay content to KERC from national province and kabupaten sources.	Material to be recorded at KERC for use as needed by teachers and other villagers.
KERC	Resource center from which village teachers and officials can draw programs for use when they are most appropriate.	Content especially designed for ·upgrading instruction by <u>teaching</u> teachers. ·supporting teachers in classroom (e.g. Bahasa Indonesian lessons) ·coordination with other materials (e.g. textbooks) ·repetition and thoughtful attention (e.g. math) ·localizing curriculum (e.g. material from local people for social studies) ·NFE, (e.g. to health, nutrition, agriculture, etc.)

The KERC is designed to provide villages with access to simple communication technology and software particularly related to rural development. Located at the kecamatan governmental level, a KERC is initially committed to making available (a) a wide range of audio materials, particularly in audio cassette format, and (b) the equipment necessary to use those materials in the villages.

Depending on the needs and financial support available, a KERC at some point could also employ other media, such as film, slides or portable television.

This system can serve both formal education (teachers and students in the school system) and the needs of NFE. In primary level education it can be used for in-service teacher training, a vital problem in Indonesian rural communities. In some cases this may simultaneously involve direct teaching of students via audio cassette technology. Because MECS focuses on the village level consumer, the clear organizational distinctions that may exist at the national or provincial level between teacher training, direct teaching via technology, and NFE become considerably blurred.

KERC is more than a "cassette library." It is a system which involves a production and distribution strategy. At the village level, it consists of educational and other local agencies or clubs borrowing cassette units and tapes from the kecamatan office for use in the villages.* It also involves teachers, students, villagers and various specialists participating in the creation of some of the software on a continuing basis. Thus the resources available in any kecamatan would be a composite of material funnelled in from national,provincial,and kabupaten sources, and those created by villages located in the kecamatan.

Examples of KERC in Action: teacher training.

Teachers need help in "teaching methods," in working with new textbooks, in teaching such subjects as math, Bahasa Indonesia, and social studies. In some cases not all teachers need all of this help. In others, they may not all need it at the same time. Look first at the textbook situation.

*It should be emphasized that other kinds of communication resources can be added as appears appropriate for particular areas.

Textbooks will never be uniformly distributed such that, at one point in time, a radio broadcast (or series) can be transmitted to show teachers how to use those textbooks--when the teachers need that instruction. For some, the broadcast would come before they had the books in their possession; for others, the broadcast may come long after they have had the textbooks. (The same type of situation might exist when other materials are being nationally distributed.) However the KERC can provide the flexibility that is needed. When the textbooks do reach a kecamatan, motivational and instructional material can be provided through the KERC on a cassette. A teacher can borrow the tape and listen to it as many times as he (she) needs to learn how to use the new textbooks. In short, the audio assistance can be delivered at the time when the message is needed--when the books are in hand, not months or weeks before or after.*

Also, an alert provincial education officer could also describe on the cassette ways a teacher can make the textbooks "localized" -- and the province or kabupatan education office could provide audio materials which could be used with the textbooks to make them meaningful in the local context.

Social studies. One of the goals expressed frequently in GOI documents is the need to make education meaningful, to localize it, to make it relevant. A tape might be available in the KERC which illustrates for a teacher how to use local resources in teaching social studies. If this tape is produced at the province or kabupaten level (with the possibility of inserts from the kecamatan level), it can deal with specific examples of approaches a teacher can use to make social studies more lively and interesting. In addition, the same or a companion tape could include stories told by local story tellers or early settlers, or messages from important local or regional people (the Governor, a military commander, an athlete, an artist, etc.). These could serve as background for the teacher, or the teacher could play the actual recording for the class.

(In Kecamatan Sei Ambawang, West Kalimantan, a person who came from Java 60 years ago to found a village is still living. Clearly, his story of the beginnings and changes in that village would contribute significantly to making social studies both fascinating and lively. One can easily draw the conclusion that this would also mean better learning and better teaching. Obviously the teacher could also bring that person into class if she were inspired to do so. But the man will not live forever: he should be tape recorded now for social studies lessons 10 and 15 years from now.)

*Cf. Rahim: "The effective communication of innovations in Comilla was due to two main factors. First, the communication inputs were related to the flow of physical inputs. Attempts were made to keep the messages relevant to the practical activities that could be undertaken by the village. The communication of any innovations that had not been tested locally or for which the physical supplies and services had not been arranged, was avoided. This practice helped to maintain a low expectation profile and to avoid frustrations." P. 54.

Bahasa Indonesia. The potential of using tapes in language instruction even where there is a good teacher hardly needs amplification. Where there is a teacher who needs in-service training in language teaching, use of the KERC resources can have two advantages. The KERC can bring expert language instruction directly to students, and the recordings can both directly and indirectly increase the local teacher's competence. There is considerable evidence of teachers learning from materials designed for use of their students. Thus the teacher is likely to learn better Bahasa Indoneisan from the tapes, and the teacher is likely to learn good ways of teaching the language from the models provided on the tapes. Note that this is a situation where teacher training and direct teaching of students begin to blend.

Examples of KERC in Action: non-formal education

There will never be enough field workers in health, nutrition, agriculture, family planning and child care to cover all Indonesian villages adequately. And it would be the rare exception where one field worker could handle several of these important information areas satisfactorily. There is a strong need to provide the limited number of PENMAS community education workers with resources which will stretch both his reach (number of villages and people he can make contact with) and the scope of his information resources (the number of different subjects he can manage). Presently he must usually depend on the good will, motivation and conscientiousness of people in other departments to provide personally the instruction to meet a village's NFE needs.

PENMAS could have impact in many more villages with a wide variety of NFE-type information through KERCs. Villagers could have the use of tapes on special topics such as health without having to await the arrival of a specialist such as public health person (who at any rate is more likely to be concerned with curative/dispensary type activities rather than educational/informational/preventative activities). In the village the cassette information could be used individually or by groups. In some places, a cassette "program" is more likely to stimulate group listening than a radio broadcast because often individuals own radios in a village and it is not necessary to come together to listen.*

It is possible to provide, along with a "program" cassette, a cassette which guides a volunteer (head of women's group, religious leader, village leader, etc.) in leading a discussion. For example, the recorded guide material can outline the major points covered in the program, suggest how to introduce the program, suggest how to start discussion afterwards, and provide some background information for questions most likely to be asked.** The cassette guide can also provide information that gives a local perspective to the program tape that may have originated at a national center.

*One recent (1973) study indicates the impact of the transistorized radio on village communication practices: instead of coming together to listen to the rural radio forum, villagers preferred to listen to their own transistors at home. This seems to be one of the reasons for the decline in some of the forums. Reported by Suwardo, 1976, from Soedrajat Martaatmadja, Siaran Pedesaan di Indonesia - a Country Report, Jakarta, 1975, p.2.

Although "organized" group listening with a trained leader would be an excellent adjunct to this process in order to stimulate discussion, group listening itself seems often to stimulate spontaneous discussion. There is not evidence whether or not this will lead to action, if action is the goal.

Examples of KERC in Action: reaching parents

Teachers can encourage or assign students to take cassette tapes home (with a player) for home study. It is a rare situation where parents and others in the household will not also be exposed to the content. This has a dual implication: first, parents will absorb some of the material from the tape. Second, parents may become more interested in the schooling process and be more highly motivated to keep their children in school (assuming that the content does prove to be relevant to what they perceive as the family or community welfare).

Related to the last point is the possibility of using the audio cassette system to tape-record specially prepared projects in the classroom to be played for community events. This has the advantage of involving parents and the community in the educational process, and of providing special educational projects for the children. (For example, a simple project would be to collect and record stories from local people on the history of the village. These might even be deposited in the KERC for others to borrow, or for use with future classes. Another possibility is to record local music,* or "success stories" in agriculture or other local industry to be played on radio stations.)

KERC software production

In the preceding text, several sources of content for the KERC have been suggested or implied. That topic is dealt with more directly, in the following paragraphs.

** (page 24)
A system similar to this is being used successfully in the Basic Village Education Program in Guatemala.

*A rural development project in Ecuador generated considerable enthusiasm among villagers for recording indigenous music. The actual leadership for doing the recording seems to have come from within the village. See James Hoxeng, Tabacundo -- Battery Powered Dialogue, Technical Note No. 10, Center for International Education, University of Massachusetts, Amherst, 1976.

Village production. Villagers (teachers, village head, etc.) could borrow a tape machine and blank tape to make simple recordings for "exercises", for a permanent addition to the KERC resource collection, and for feedback to outside agencies. The possibilities of villagers producing materials which can be used in programs related to their community's own development should be stressed. There is growing evidence that highly "professional" productions put together with sophisticated hardware are not necessary characteristics of effective development materials.* Local production also has the advantage of using "known" and authoritative people as well as linking with some traditional media forms.

Kecamatan. At this level of government there is a variety of specialists (family life welfare, agriculture, etc.) who can contribute content patterned for the local area to the KERC.** In the kecamatans where there is a PENMAS official (60% of the nation's kecamatans have one), he can stimulate the development of these materials. This is one level at which social studies material can also be collected.

Kabupatan/Province. Many kabupatans have SPGs, the high schools which train elementary school teachers. They can be encouraged to produce tapes for teacher training. In addition, specialized government departments have more staff and other resources at this level and can prepare taped materials to be duplicated and sent to the KERC. At this level, also, there are government and RRI radio stations which have facilities that might be used for more sophisticated productions.

The SPGs can play a particularly important role. Their own students can themselves begin to use audio cassette technology in student projects. These projects, properly planned and supervised, can be the source of substantial amounts of software for in-service training. There is a dual impact here: students can participate in the development of "teacher training" software, and they can become familiar and comfortable with audio as a means for delivering and acquiring instruction. They will be the teachers in the next 10 or 20 years who will be in the villages -- themselves targets of "upgrading", and themselves users of educational technology resources such as radio and KERC.

*This point is amplified in the author's "Why Not a Communication Cooperative," forthcoming. See also Evans (1976) pp. 30-31. Details on how to develop content that meets local needs are provided in Royal D. Colle and Susana Fernandez de Colle, The Communication Factor in Health and Nutrition Programs, A Case Study from Guatemala, World Health Organization, Geneva, 1976.

National centers. Various GOI departments can produce materials for nationwide distribution. These can be made available to the KERC for circulation on the local level. It can be made more meaningful, also, if the lower levels of government are able to add to the material to make it relevant to the particular province, kabupatan, or kecamatan. For example, if there is a major GOI plan for credits to rural villages, or to low income farm families, the details on implementation (at whatever level implementation is to take place) can be added to the centrally-produced explanation.

There are other agencies producing soft-ware which might be suitable for the KERC system. For example, UNICEF is planning to create a Child Development Media Unit at the National Training and Research Center for Community Education (PPLNPM) at Lembang/Jayagiri (West Java). Although the UNICEF project focuses on a limited number of communities on Java, its materials--with and without adaptation--might have relevance to KERCs in other places. Other software development projects coming out of PPLNPM as a result of World Bank support might also produce suitable material for KERC.

Social studies materials from the nation's capital certainly could be readily produced and distributed through the KERC system.

The KERC diffusion system.

How do materials reach the village? The central point from which materials radiate to the villages is the kecamatan, but the actual "delivery system" will vary from place to place. In West Kalimantan, river taxis provide access between the kecamatan and the villages. In other locations it may be a missionary airplane or a commercial system such as public bus transportation. But the link will usually be a surface transportation link.

**(page 25)

Departments at the national level usually have officials representing them at government levels down to the kecamatan.

Getting materials to the KERC. The content made available to villages reaches the KERC in three ways: (1) Cassette tape recordings can be physically delivered to the KERC from Jakarta, a province capital or a constituent village by regularly available means: mail, messenger, etc. (2) Some content may be recorded by the KERC itself. (3) And some content may be relayed via a radio broadcast to the KERC where it is recorded for the KERC collection. One link in a national relay system may include satellite relay.

Following are some typical paths that would be used in the system:

Production point	Intermediate links	KERC action
Kabupatan SPG: in service teacher training material	Messengers carried via available transport to KERCs	Placed in collection
PPLNPM/Lembang: child development information	Recording to Jakarta by mail. Duplicated. Shipped via air to provincial capitals. Local dimension added. Relayed by radio to KERCs	Recorded off-the-air by KERC. Placed in collection
Jakarta: discussion of rural education policy in Repelita	To provinces via satellite. Relayed via radio to KERC	Recorded off-the-air by KERC. Placed in collection
Provincial capital: education needs and development of region	Delivered to KERC through government organizational apparatus	Placed in collection
Village: dalang recorded.	Sent to KERC via local official or messenger	Placed in collection
KERC: records information on local agricultural techniques		Placed in collection

Some special notes on KERC. To the extent that it supports official policy some KERC materials can be available in the "local" languages.

The KERC system does not require a constant input of new material. Emphasis can be given to producing quality materials intermittently rather than meeting regular program deadlines with whatever material is readily available.

The following diagram illustrates the "structure" of a KERC. (see page 29.)

RADIO in the MECS.

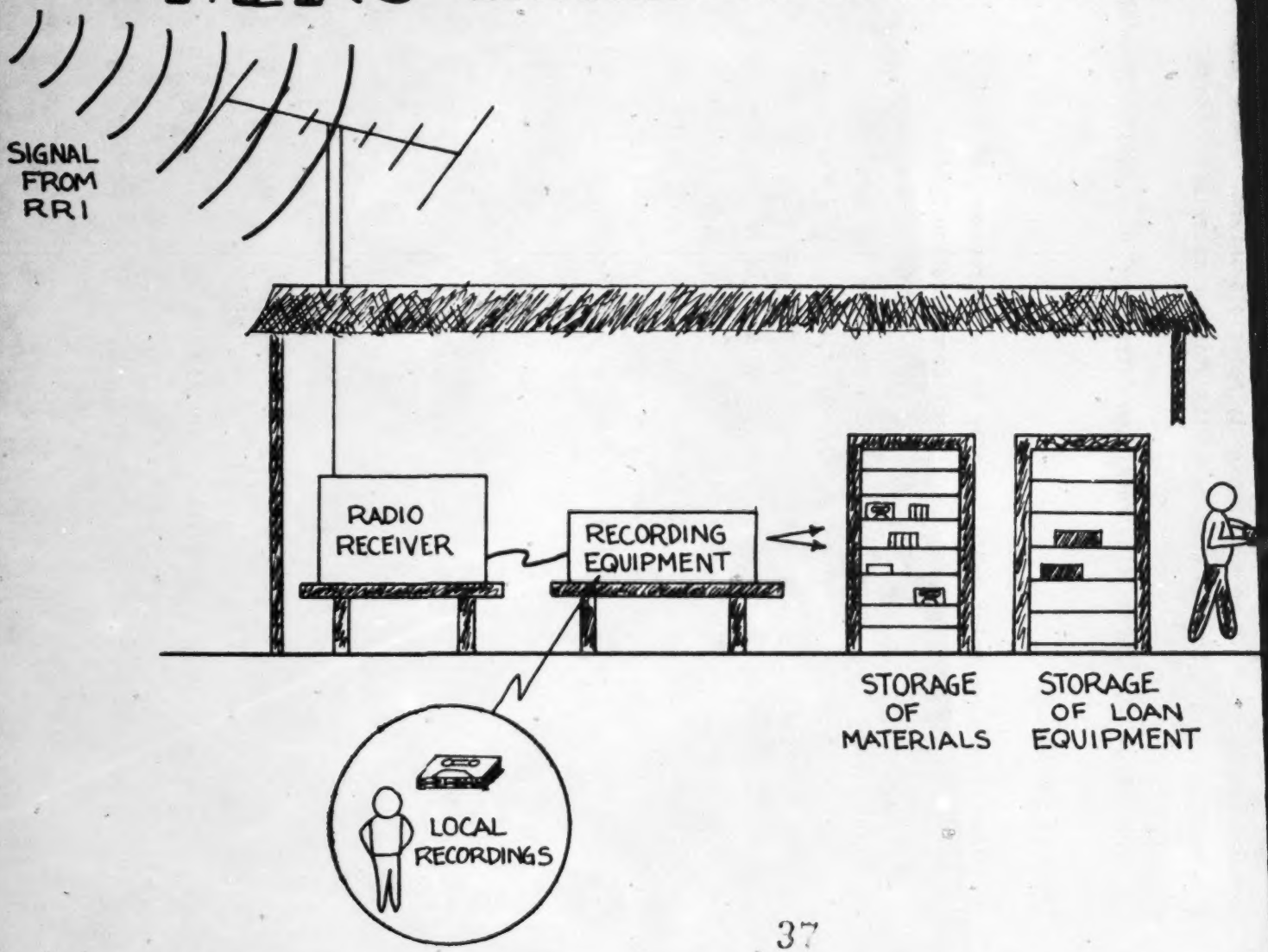
There are three roles radio can play in the improvement of rural education, as part of the Model Educational Communication System.

Relaying material to KERCS. This relay operation was discussed in the section on KERCs. Often radio stations in the government system (RRI) do not broadcast during parts of the morning and afternoon. For example, the station at Pontianac (West Kalimantan) is "silent" between 9-12 in the morning. During this period "programs" can be broadcast by RRI and government stations primarily as a means for distributing material to KERCs. The KERCs can record it off the air and deposit the recordings in the KERC collection. Whatever additional audience listened to these broadcasts "live" would be a bonus although the content would not generally be intended for casual listening.

General in-service training content. Listed on pages 17 and 20 was some of the content most appropriate for broadcast as part of in-service training for teachers. These programs could be designed for regular listening (e.g. weekly) and convey timely information, recognition of teacher efforts, and development accomplishments, organizational and philosophical aspects of educational programs, as well as management and "housekeeping" materials.

Promotion of KERC materials. An important aspect of the KERC system is awareness on the part of teachers and villagers of the materials available in the KERC. Spot announcements and the regular education program broadcast by the radio stations can promote the use of these materials in the villages, and can serve as a "stage" for exposing suitable village-recorded materials to a broader audience.

KERC: KECAMATAN EDUCATIONAL RESOURCE CENTER



Sources of content for radio. The operating center for the in-service teacher training program on radio is most appropriately at the provincial capital, where there is a substantial unit of the Department of Education and Culture. From this center, the Department can draw on its own staff resources, the SPGs, and the resources available from Jakarta. Material from Jakarta can be relayed via satellite to RRI studios via the local satellite ground station.

The diagram on the following page summarizes the features of the Model Educational Communication System from a village level view.

Relationship to television

It will be a long time before there will be a television set in every village, and before the power is there to run the set, and the software resources are available to continuously feed the system with rural development information. An intermediate step might well be a use of television in a pattern similar to the use of ACT in the MECS and KERC.* Television modules designed to accomplish discrete, short term goals might be "packaged" in a videocassette format and rotated around the kabupatan or kecamatan to meet specific needs of specific areas for teacher training, direct teaching, and NFE. The KERC model may help to answer some questions about the assets and liabilities associated with this kind of strategy in supporting a village's needs in education.

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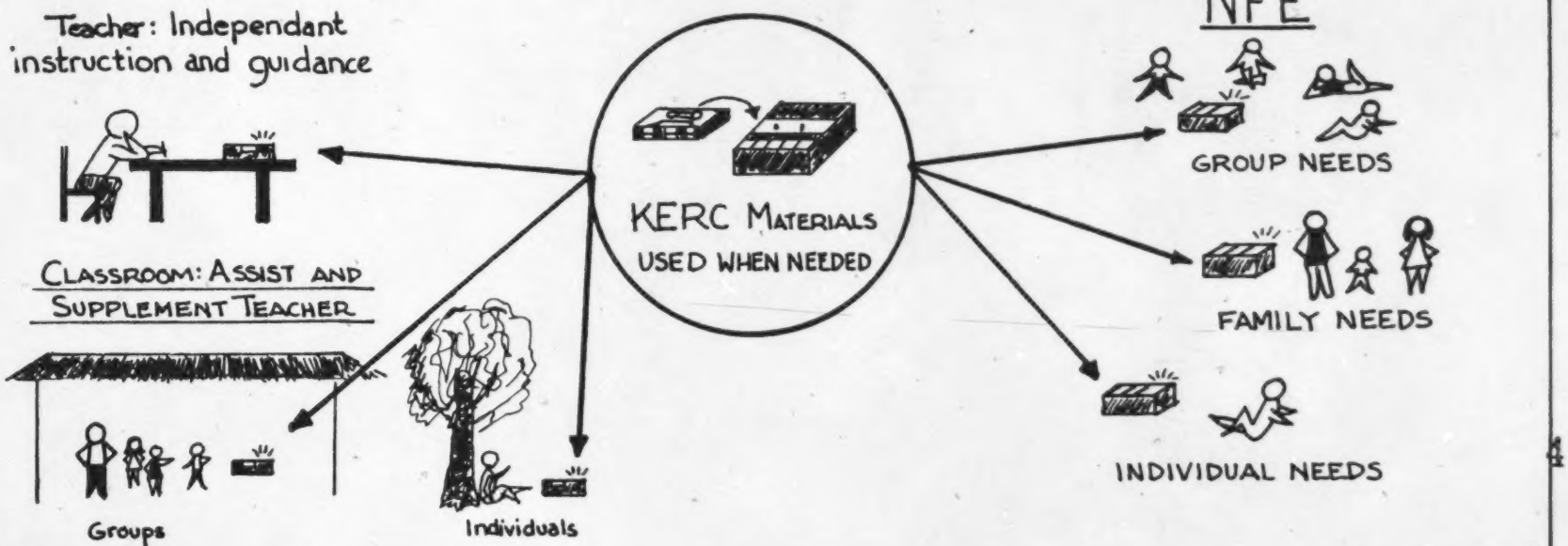
*Several guidelines from a recent study by Jonathan Gunter on the use of television for non-formal education (NFE-TV: Television for Non-Formal Education, Center for International Education, University of Massachusetts, Amherst, 1975) seem appropriate here:" 1) television will be secondary to radio in appropriateness for most non-formal education projects; 2) television should be restricted to settings where the medium is already present, which means primarily urban settings;... 4) television should be used to facilitate communications between rural areas and urban areas, with the emphasis being on educating urban-based decision makers about the needs and reality of the rural area; and 5) that television should develop a much more even balance between professional production of messages reflecting institutional needs, and participating communities." Quoted by Evans (1976).

VILLAGE-LEVEL VIEW OF MODEL EDUCATIONAL COMMUNICATION SYSTEM



Conclusion.

Programs emphasizing self-help and local initiative do not, of course, require satellites to make them work. Including satellites in MECS is partly a response to a political reality and partly an experiment to test the economic and organizational feasibility of using a satellite as a distribution mechanism to overcome hostile geography. In other settings, the same purpose might be served using a bus system or the mail.*

The important part of the MECS lies in its redefinition of the roles and responsibilities of change agents and villagers. Relatively simple communication technology makes it possible to shift more control of the rural development process to villages. Professional change agents can devote more energy to mobilizing resources which can be spread more widely and with less loss of content integrity. Development planners and government agencies can influence the direction that development takes through their own contribution of resources to the KERCs and radio broadcasts by actively promoting the availability of those resources, and by assisting in the implementation of programs called for by villages with services which villages themselves cannot supply.

Important, also, is the need for governments to pass and enforce regulations such as GOI Decree No. 32 to discourage government departments from trying to develop their own corps of ill-prepared development field-level workers.

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*For example, the thana-based rural development program in Bangladesh seems to have an organizational pattern similar to that desirable for a system like MECS. Presently the link between the village and the "resource" (training) center consists of village representatives instead of communication technology, and there is little choice for a village to select the kind of information and training it receives from the center.

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